WHAT IS CLAIMED IS:

1. A method for determining a concentration of an analyte within a material sample, said method comprising:

inducing said material sample to emit electromagnetic energy in a time-varying manner;

measuring, at at least one wavelength, said induced electromagnetic energy emitted by said material sample;

determining a phase of said electromagnetic energy;

converting said phase into an absorption value; and

determining said concentration of said analyte based at least in part on said absorption.

2. The method of Claim 1, wherein converting said phase into an absorption value comprises converting said phase into a normalized absorption.

3. The method of Claim 2, wherein determining said concentration of said analyte based on said absorption comprises determining said concentration of said analyte based on said normalized absorption.

4. The method of Claim 1, wherein measuring comprises analyzing said material sample with an optical measurement system.

5. The method of Claim 4, wherein said optical measurement system comprises an array of wavelength-specific detectors.

6. The method of Claim 4, further comprising correcting said optical measurement system for temporal variations in performance.

7. The method of Claim 1, wherein inducing said material sample to emit electromagnetic energy in a time-varying manner comprises inducing a periodically modulated thermal gradient in said material sample.

8. The method of Claim 1, wherein said electromagnetic energy comprises infrared radiation.

9. A method for determining a concentration of an analyte within a material sample, said method comprising:

determining at least a portion of a phase spectrum based on electromagnetic energy emitted by said material sample;

converting said at least a portion of said phase spectrum into at least a portion of an absorption spectrum; and

determining said concentration based on said at least a portion of said absorption spectrum.

10. The method of Claim 9, wherein converting said phase spectrum into an absorption spectrum comprises converting said phase spectrum into a normalized absorption spectrum.

11. The method of Claim 10, wherein determining said concentration of said analyte based on said absorption spectrum comprises determining said concentration of said analyte based on said normalized absorption spectrum.

12. The method of Claim 9, wherein said phase spectrum comprises an ideal phase spectrum.

13. The method of Claim 9, wherein determining a phase spectrum comprises analyzing said material sample with an optical measurement system.

14. The method of Claim 13, wherein said optical measurement system comprises an array of wavelength-specific detectors.

15. The method of Claim 13, further comprising correcting said optical measurement system for temporal variations in performance.

16. The method of Claim 9, further comprising inducing a periodically modulated thermal gradient in said material sample.

17. The method of Claim 9, wherein said electromagnetic energy comprises infrared radiation.

18. An analyte detection system comprising:

a detector array;

a processing circuit in communication with said detector array; and

a module executable by said processing circuit whereby said processing circuit converts a phase spectrum, said phase spectrum based on electromagnetic energy emitted by a material sample and measured by said detector array, into an absorption

spectrum and determines a concentration of an analyte within said material sample based on said absorption spectrum.

19. The analyte detection system of Claim 18, further comprising means for inducing said material sample to emit electromagnetic energy in a time-varying manner, said means for inducing being in communication with said processing circuit.

20. The analyte detection system of Claim 18, further comprising means for inducing a periodically modulated thermal gradient in said material sample, said means for inducing being in communication with said processing circuit.

21. The analyte detection system of Claim 18, wherein said electromagnetic energy comprises infrared radiation.

22. A method of estimating analyte concentration in a sample comprising:

applying a time varying temperature to a portion of a sample;

measuring time varying infrared radiation intensity received from said sample in at least one wavelength band;

calculating an absorption coefficient α in said wavelength band based at least in part on said time varying infrared radiation intensity received from said sample.

23. The method of Claim 23, additionally comprising calculating a phase difference θ between said time varying temperature and said time varying infrared radiation intensity and calculating said absorption coefficient α based at least in part on said phase difference θ.

24. The method of Claim 24, wherein said absorption coefficient is calculated from said phase difference according to the formula $\tan[\theta(\lambda)] = \frac{-\gamma}{[\alpha(\lambda)+\gamma]}$, wherein $\gamma = \sqrt{\omega/2\beta}$, wherein ω is the angular modulation frequency in radians/sec, and β is the coefficient of thermal diffusivity of the sample.